

# Warfighter Protection

A F U T U R E N A V A L C A P A B I L I T Y

**W**e owe our Sailors and Marines the best possible protection from operational threats. The aim of warfighter protection is to keep them from becoming battle or non-battle casualties, and especially to reduce morbidity and mortality throughout the battlespace.

**Why is this Future Naval Capability Important?** New asymmetrical threats pose new risks to Sailors and Marines. These require new responses.

**What's our investment strategy?** Our core investment program focuses on identifying and filling capability gaps while fulfilling commitments to funded acquisition programs. The strategy applies limited resources to high-payoff deliverables that will save lives and preserve a healthy and fit force. It emphasizes far-forward casualty care, it seeks to capture mature technologies for early transition, and it uses discovery and invention resources to address basic issues that arise during technology development. Three enabling capabilities will get us to this FNC:

- **First priority.** We need to improve combat casualty care and management.
- **Second priority.** We need to prevent casualties.
- **Third priority.** We need a fit, healthy force.

How are we filling the gaps in those enabling capabilities? Each enabling capability will have a set of milestones and transition opportunities.

**First Priority: Combat casualty care and management.** In particular, we need to treat casualties as far forward as possible, providing lifesaving interventions in an increasingly lethal battlespace with reduced infrastructure and logistics. We're

working to fill those gaps with these technologies:

- **In FY 2001, FY 2002, and FY 2006:** Non-invasive ultrasound methods of far-forward casualty diagnosis and treatment.
- **In FY 2003 and FY 2005:** Low volume resuscitation fluids that inhibit shock and secondary trauma demonstrated.
- **In FY 2004 and FY 2006:** Reduced metabolism—lengthening trauma casualties' "Golden Hour."

• **In FY 2005:**

Hemostatic field dressing with antibiotics demonstrated. Portable injectable water production system demonstrated.

• **In FY 2006:** Non-cryogenic suspended animation.

• **In FY 2007:**

Oxygen-carrying blood substitutes (artificial blood).

• **In FY 2007:** Pain control without performance degradation.

• **In FY 2007:**

Treatment enhancements and prophylaxis for shock.

• **In FY 2007:**

Casualty management for Operational Maneuver from the Sea, and in special operations, including intratheater transport, self-contained patient monitors, and critical care for transport, shipboard, and undersea operations.

**Transition Opportunities:**

- Hemostatic field dressing—transition to US Marine Corps, FY02.
- Handheld ultrasound for hemostasis—transition to US Marine Corps, FY03.
- Portable medical water production system—transitions to operating forces: FY03 (shipboard system); FY06 (man-portable system).
- Low volume resuscitation fluids—transitions to operating forces: FY03 (resuscitation without head trauma), FY04 (80% fluid volume reduction), and FY07 (support cells to inhibit secondary injury).
- Casualty Management Sensor Suite—transition to US



Marine Corps and Bureau of Medicine, FY07.

### **Second Priority: Casualty prevention.**

We need to enhance Sailors' and Marines' situational awareness, and counter the threat of disease, battle, and non-battle injury. We're working to fill gaps with these technologies:

- **In FY 2000:** Novel applications of DNA technologies to vaccines for tropical diseases.
- **In FY 2002:** Laser incident detection demonstrated.
- **In FY 2002 and FY 2005:** Advanced environmental control systems.
- **In FY 2003:** Enhanced body armor—body armor biodynamics.
- **In FY 2003:** Salivary test for disease demonstrated.
- **In FY 2005:** Aircrew Integrated Life Support Systems demonstrated.
- **In FY 2007:** Smart uniform with embedded physiological sensors and an individual computer with data capture, storage, interpretation, and telemetry capability.
- **In FY 2007:** Enhanced maintenance of spatial orientation.

#### ***Transition Opportunities:***

- Advanced Personal Environmental Control System—transition to operating forces, FY 02.
- Salivary tests for disease—periodic transitions to operating forces, FY 03 through FY 08.
- Agile Laser Eye Protection—transition to Naval Air Systems Command and US Marine Corps FY 03.
- Aircrew Integrated Life Support Systems—transitions to Naval Air Systems Command: FY 03-FY 04 (Helicopter Aircrew Integrated Life Support Systems), FY 04-FY 05 (Tactical Aircrew Integrated Life Support Systems), and FY 06-FY 07 (Smart Aircrew Integrated Life Support Systems).
- Advanced Multi-Purpose Diving System—transition to Naval Special Warfare Command and Explosive Ordnance Disposal, FY 04-FY 06.

*“Our program for enhanced force medical protection relies on exploiting advanced technologies such as the electronic medical record and biosensing. Emerging technology and heightened awareness give us the best opportunities ever for protecting the force — opportunities we must not and will not neglect.”*

*—General Henry H. Shelton, Chairman, Joint Chiefs of Staff*

- Body Armor Test Standards—transition to US Marine Corps, US Army, and National Institute of Justice, FY 04-FY 06.
- Smart Fire Fighting and Damage Control Ensemble—transition to Naval Sea Systems Command and DD-21, FY 06-FY 08.

**Third Priority:** We must be able to preserve a healthy, fit, and ready force that can withstand physical and psychological threats throughout the operational continuum. We're working to fill gaps with these technologies:

- **In FY 2002:** Tuned acoustic materials for hearing protection demonstrated.
- **In FY 2002 and FY 2003:** Injury prevention and optimized fitness—optimized equipment design demonstrated.
- **In FY 2005 and FY 2006:** Hearing protection and restoration demonstrated.

#### ***Transition Opportunities:***

- Tuned acoustic hearing materials—transition to protective devices for operating forces, FY 03–FY 04.
- Injury prevention and optimized fitness for existing platforms—transition to operating forces, FY 05–FY 06.
- Physical performance enhancement—transition to operating forces, FY 06–FY 07.
- Injury prevention and optimized fitness for future platforms—transition to operating forces, FY 07–FY 08.

### **What's some of the relevant discovery and invention**

**science and technology?** Exploitation and delivery depend upon discovery and invention. In ONR's vertically integrated program, we will continue to exploit basic work that proves relevant to warfighter protection:

- **Biosensors, biomaterials, and bioprocesses** increase our understanding of the fundamentals of casualty care.
- **Human factors** investigations are essential to improving the interface between Sailors and Marines and the machines that serve them.
- **Combat casualty care and management** addresses the unique requirements of the Navy and Marine Corps in their operating environment.
- **Casualty prevention** studies will spare Sailors and Marines from injury or death by increasing our understanding of immunity, hazard detection, physical conditioning, and situational awareness.
- **Functional materials** will enhance our ability to provide not only sensors, but also protective devices.

